

Algebra Book Answers

11 Inequalities

1. possible values:

-1, 0, 1, 2, 3 "Integer"

2. a) $x > -3$



b) $7y - 34 \leq 8$

$$7y \leq 8 + 34$$

$$7y \leq 42 \quad \div 7$$

$$y \leq 6$$

c) -2, -1, 0, 1, 2

3. $4x - 1 < 2x + 19$

$$4x - 2x < 19 + 1$$

$$2x < 20 \quad \div 2$$

$$x < 10$$

4. a)



b) $-3 < x \leq 4$

c) $4t - 5 > 11$

$$4t > 11 + 5$$

$$4t > 16 \quad \div 4$$

$$t > 4$$

5. a) -1, 0, 1, 2, 3

b) $-4 < x \leq 3$

c) $3y - 2 > 13$

$$3y > 13 + 2$$

$$3y > 15 \quad \div 3$$

$$y > 5$$

6. a) $-2, -1, 0, 1.$

b) $3p - 7 > 11$

$$3p > 11 + 7$$

$$3p > 18 \quad \div 3$$

$$p > 6$$

ii) $3x - 3 > x + 1$

$$3x - x > 1 + 3$$

$$2x > 4 \quad \div 2$$

$$x > 2$$

smallest value = 3

c) $-4 \leq 2n < 3 \quad \div 2$

$$-4 \leq n < \frac{3}{2}$$

$$-2 \leq n < 1.5$$

poss. values: $-2, -1, 0, 1$

b) $7y - 34 \leq 6 - 3y$

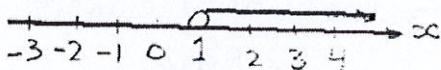
$$7y + 3y \leq 6 + 34$$

$$10y \leq 40 \quad \div 10$$

$$y \leq 4$$

7. i) $x \leq 3$

$$x > 1$$



9. a) $5x + 12 < 17$

$$5x < 17 - 12$$

$$5x < 5 \quad \div 5$$

$$x < 1$$

b) $3(2y + 1) > 9$

$$2y + 1 > 3$$

$$2y > 3 - 1$$

$$2y > 2$$

$$y > 1$$

8. a) i) $7x - 3 > 18$

$$7x > 18 + 3$$

$$7x > 21 \quad \div 7$$

$$x > 3$$

(29)

$$\begin{aligned}
 10. a) \quad & 2x - 9 < 6x + 3 \\
 & -9 - 3 < 6x - 2x \\
 & -12 < 4x \quad \div 4 \\
 & -3 < x
 \end{aligned}$$

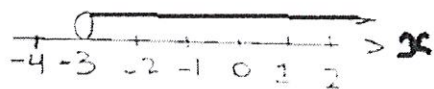
$$\begin{aligned}
 & 2x - 9 < 6x + 3 \\
 & 2x - 6x < 3 + 9 \\
 & -4x < 12 \quad \div (-4) \\
 & x > -3
 \end{aligned}$$

Very Important

When dividing or multiplying by a negative number, we MUST switch the

inequality sign. ($< \rightarrow >$)
($> \rightarrow <$)

b)



$$\begin{aligned}
 11. \quad & c^2 d \leq -10 \\
 & c^2 \leq \underline{-10} \\
 & c \leq \sqrt{\frac{-10}{d}}
 \end{aligned}$$

$d > 0 \rightarrow$ Inequality cannot be true

$d = 0 \rightarrow$ Inequality cannot be true

$d < 0 \rightarrow$ Inequality must be true

$$\begin{aligned}
 & c^2 d \leq -10 \\
 & d \leq \frac{-10}{c^2}
 \end{aligned}$$

$c > 0 \rightarrow$ Inequality must be true

$c = 0 \rightarrow$ Inequality cannot be true

$c < 0 \rightarrow$ Inequality must be true

12. $K < n$ "Many possible answers"
 $K^2 > n^2$

$K = -5, n = -4$

$-5 < -4$
 $(-5)^2 > (-4)^2$ True
 $25 > 16$

13. a) $-1, -2, -3, \dots$
 $\dots -50, -60$

b) $2y + 3 \leq 11$
 $2y \leq 11 - 3$
 $2y \leq 8 \quad \div 2$
 $y \leq 4$

largest value = 4

14. a) $x > 100$

b) $x < 10$

15. a) $y + 2 < 3$
 $y < 3 - 2$
 $y < 1$

values: $-2, -1, 0$

b) i) $y + 2 < 3y$
 $2 < 3y - y$
 $2 < 2y \quad \div 2$
 $1 < y$

values: 2

ii)

Inequality (i) needs any number less than 1

Inequality (ii) needs any number more than 1

and there is no number that can be less than and more than 1 at the same time